UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/638,173	08/06/2003	Robert Kain	ILLINC.026C1	3813

20995 7590 10/09/2009

KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER	
FORMAN, BETTY J	

ART UNIT	PAPER NUMBER
1634	

NOTIFICATION DATE	DELIVERY MODE
10/09/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com
eOAPilot@kmob.com

Office Action Summary	Application No.	Applicant(s)	
	10/638,173	KAIN ET AL.	
	Examiner	Art Unit	
	BJ Forman	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *60,65-71,76-83,88-96,101-117 and 126-141* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *60, 65-71 76-83, 88-96, 101-117 and 126-141* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

FINAL ACTION

Status of the Claims

1. This action is in response to papers filed 27 August 2009 in which claim 89 was amended, claims 134-141 were added and the previous rejections were traversed. The amendments have been thoroughly reviewed and entered.

The previous rejections in the Office Action dated 27 February 2009 are maintained. Applicant's arguments have been thoroughly reviewed and are discussed below. New grounds for rejection, necessitated by the new claims, are discussed.

Claims 60, 65-71 76-83, 88-96, 101-117 and 126-141 are under prosecution.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 60, 66-71, 77-83, 89-96, 103-104, 106-117, 127, 129 and 131-141 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walt et al (U.S. Patent No. 6,327,410, filed 11 September 1998) in view of McDevitt et al (U.S. Patent No. 6,680,206, filed 16 July 1999) and/or Seul et al (U.S. Patent No. 7,041,510, filed 17 September 1999).

Regarding Claim 60, 71, 83, 94, Walt et al disclose an array and method of making the array comprising a substrate having a surface (Column 5, lines 32-60), a first assay location and second assay location on the surface (Column 5, line 61-Column 6, line 30), wherein the substrate has a first plurality of depressions in first and second assay locations and first and second microsphere populations randomly placed in the assay locations wherein the assay locations spatially identifiable (Column 18, line 59-Column 18, line 5).

Walt et al teach the assay locations comprising marker beads (Column 19, line 4) but do not teach blank beads in the assay locations.

However, blank beads were well known and routinely practiced in the art of bead arrays at the time the invention was made as taught by McDevitt and Seul.

McDevitt et al teach a similar array and method of making the array comprising a substrate having a surface (Fig. 3), a first assay location and second assay location on the surface (#250, Fig. 3, Column 39, lines 15-34 and Column 40, lines 34-37), a first plurality of depressions in first and second assay locations and first and second microsphere populations randomly placed in the assay locations (Column 10, lines 13-16) and wherein assay locations comprises blank microspheres (Column 25, lines 1-45 and Fig. 16) wherein the blank microspheres provide a reference signal to which multiple different signals can be compared thereby allowing simultaneous evaluation of multiple chemically distinct analytes (Column 25, lines 1-8).

Seul also teach a similar array and method of making the array comprising a substrate having multiple assay locations and multiple populations of beads randomly

distributed in the assay locations (e.g. Fig. 28) wherein the assay locations further comprise blank beads (i.e. spacer particles) to provide interparticle spacing of analyte beads and thereby allowing optical analysis of individual analyte particles (Column 25, lines 2-21).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the blank beads of McDevitt and/or Seul to the array of Walt. One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success and for the added benefits of providing appropriate spacing of analyte beads allowing optical analysis of individual analyte particles (Seul, Column 25, lines 2-21) and/or providing a reference signal to which multiple different signals can be compared allowing simultaneous evaluation of multiple chemically distinct analytes (McDevitt, Column 25, lines 1-8).

Regarding Claim 66, 77, 89, Walt et al teach the array wherein the bioactive agent comprises a nucleic acid (Column 10, lines 28-35). McDevitt et al disclose the array wherein the bioactive agent comprises a nucleic acid (Column 5, lines 45-65) and Seul et al teach the bioactive agent comprises a nucleic acid (Example IX).

Regarding Claims 68, 79, 91, 103, Walt et al teach the array is within a hybridization chamber (Fig. 4). McDevitt et al teach the similar array wherein the substrate is enclosed within a hybridization chamber (Fig. 17, Column 26-27).

Regarding Claims 69, 80, 92, 104, Walt et al teach the array wherein the substrate comprises a membrane i.e. over the beads (Column 6, lines 45-47) and

McDevitt et al teach the similar array wherein the hybridization chamber comprises a flexible membrane (Column 11, line s 40-44).

Regarding Claims 82 and 106, Walt et al teach the depressions are wells (Column 6, lines 16-30). McDevitt et al teach the similar array wherein the depressions are wells (Fig. 3) and Seul et al teach the similar array wherein the depressions are wells formed via hydrophobic grid (Column 23, lines 9-15).

Regarding Claim 107-108, Walt et al teach the method further comprising preparation of the DNA by PCR (Column 23, lines 5-8).

Regarding Claim 109-111, Walt et al teach the method wherein the bioactive agent is DNA (Column 10, lines 28-35) and the method includes sequencing (Column 24, lines 51-52). While Walt et al teaches the array is used for sequencing, the sequencing practiced with the array produced by the method, does not further define the method of making the array. As such, the recited sequencing methods do not further define the method of Claim 94 for making the array. Furthermore, Felder et al teaches the similar method determines the sequence (column 11, lines 23-48).

Regarding Claims 95-96, 112-117, Walt et al teach the arrays and methods wherein each subpopulation is randomly distributed such that members of each subpopulation are in multiple sub-bundles (Column 18, line 48-Column 19, line 53). Seul et al teach the similar array wherein each subpopulation is randomly distributed such that members of each subpopulation are in each assay location (Fig. 28, Column 44, lines 43-67).

Regarding Claims 126, 129, 131 and 132, Seul et al teach the similar array wherein hybridization between the target and bean-immobilized capture probe occur prior to bead immobilization on the support thereby providing both double and single stranded nucleic acids on the beads. Seul teaches that hybridization prior to surface immobilization facilitate subsequent analysis of strands of interest (Column 32, line 62-Column 33, line 7). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the solution hybridization prior to immobilization as taught by Seul to the array and method of Walt. One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success and for the added benefit of facilitating subsequent analysis of strands of interest as desired in the art (Seul, Column 32, line 62-Column 33, line 7).

Regarding Claim 134-141,Walt teaches the array and methods providing one bead/depression thereby providing no more than one bead from each of the first and second population (Column 17, lines 3-10).

4. Claims 65, 67, 70, 76, 78, 81, 88, 90, 93, 101, 102, 105, 126, 128, 130, 133 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walt et al (U.S. Patent No. 6,327,410, filed 11 September 1998) in view of McDevitt et al (U.S. Patent No. 6,680,206, filed 16 July 1999) and/or Seul et al (U.S. Patent No. 7,041,510, filed 17 September 1999) as applied to Claims 60, 71, 83, 94 above and further in view of Felder et al (U.S. Patent No. 6,232,066, filed 2 July 1998).

Regarding Claims 65, 70, 76, 81, 88, 93, 101, 105, 126, 130, 133, Walt et al teach the assay locations are spatially identifiable manually but the reference does not specifically teach the assay locations are separated. However, array locations separated by gaskets were well known in the art at the time the claimed invention was made as taught by Felder et al (Fig. 4-5).

Felder et al teach a substrate (Column 5, lines 1-13) having a plurality of assay locations (regions), each having a subpopulation of bioactive agents (e.g. genomic DNA, Column 6, lines 52-67) wherein the assay locations are separated by a gasket forming an array of wells-within-wells (e.g. wax or silicone barriers/well separator, Column 5, lines 19-59; Column 6, lines 38-51; Column 13, lines 1-22; and Fig. 5) whereby the assay locations are spatially discrete, identifiable and addressable within a fluidically controlled environment (Column 5, lines 19-59).

Walt clearly desires segregation of the subpopulations to provide spatial encoding of the microspheres and suggests manual techniques to do so (Column 18, line 59-Column 19, line 5). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the barrier elements of Felder et al to the substrate of Walt et al. One of ordinary skill in the art would have been motivated to do so based on the desired segregation of Walt et al and further for the expected benefit of providing for fluidically controlled multi-sample testing without cross contamination between adjacent regions as taught by Felder et al (Column 5, lines 19-59).

Regarding Claim 67, 78, 90, 102, Walt et al teach the array wherein the support is planar glass (Column 5, lines 57-60). McDevitt (Column 8, line 64) and Seul (Column 9, line 46) also teach glass substrate. Felder et al teach the similar array wherein the glass support is a glass slide (Column 5, line 2). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the slide of Felder to the glass substrates of Walt, McDevitt and/or Seul. One of ordinary skill in the art would have been motivated to do so based on the commercial availability of microscope slides.

Response to Arguments

5. Applicant argues that the cited art does not teach random distribution of blank microspheres. Applicant acknowledge that McDevitt uses blank microspheres but asserts that "It is clear from Example 2 and Figure 16 of the McDevitt et al references that the bland microspheres as well as each of the differentially derivatized microspheres were positioned on the array such that their locations were known". The assertion is noted. However, it is unclear to the examiner how the cited teachings illustrate known locations. Figure 16 is a chart listing color responses for beads in various solutions and Example 2 is silent regarding known locations. Furthermore, McDevitt specifically teaches randomly placed microsphere populations (Column 10, lines 13-16). Therefore, Applicant's assertions of known locations are not persuasive.

Applicant acknowledges that Seul uses blank microspheres, but argues that the reference teaches the microspheres are random with respect to chemical identity but spatially ordered. From this, Applicant asserts that a skilled artisan using blank

microspheres to increase spacing would view ordered including of blank microspheres as a necessary method for achieving regular spacing between all of the encoded microspheres. The argument has been considered but is not found persuasive. As Applicant notes, the microspheres of Seul are random at least with respect to chemical identity. Furthermore, as cited in the Office Action, Seul specifically teaches and illustrates the randomly distributed microspheres (Fig. 28). While the resulting arrangement may be spatially ordered (e.g. 4x4 matrix), the microspheres of Seul are randomly distributed (Column 9, lines 17-20). Applicant's argument regarding the skilled artisan's use of blank microspheres is not supported by any factual evidence of such an interpretation. Therefore, the assertion is deemed unsupported arguments of counsel.

Applicant further asserts that claims 112-117 provide further basis for patentability by requiring that blank microspheres are located in the same depressions as microspheres comprising the bioactive agent. The argument has been considered. However, it is maintained that the references teach all the elements of the claims. The independent claims require random distribution of a second population of microspheres wherein the second population comprises blank microspheres. Thus, the second population is not limited to only blank microspheres. Claims 112-117 defines the depressions of the first and second assay locations as having microspheres from both the first and second microsphere populations. As discussed above, all the of the references teach random distribution of microsphere populations and Seul specifically illustrates both populations in both assay locations (Fig. 28, Column 44, lines 43-67).

It is maintained that the instantly claimed invention is obvious in view of the prior art as discussed above. The rejections are maintained and made Final.

Conclusion

No claim is allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (571) 272-0741. The examiner can normally be reached on 6:00 TO 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Schultz can be reached on (571) 272-0763. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BJ Forman
Primary Examiner
Art Unit 1634

/BJ Forman/
Primary Examiner, Art Unit 1634